CLAIMS

What is claimed is:

1. A compound comprising:

at least one epoxy group;

a melting point temperature that is less than 140°C; and

liquid crystallinity at a temperature greater than 150°C.

2. A composition comprising:

the compound of claim 1; and

a filler having a coefficient of thermal expansion that is comparable to that of silicon.

3. A method comprising:

contacting a surface of a microelectronic device with the composition of claim 2; and

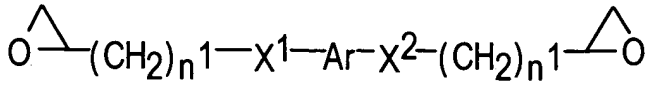
solidifying the composition on the surface.

4. A microelectronic device comprising:

a surface; and

a composition solidified on the surface by the method of claim 3.

5. The compound of claim 1, having the formula:



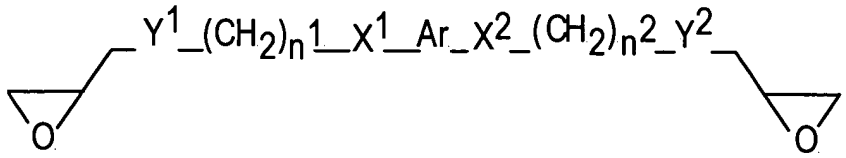
wherein

Ar includes a liquid crystalline moiety selected from trans-stilbenediyl, triphenyl, 1,4-bis(phenoxycarbonyl)cyclohexdiyl, and diphenyl 1,4-cyclohexane-dicarboxylate;

X^1 and X^2 independently of one another are selected from oxygen, carbonyl, carboxyl, oxycarbonyl, and amine; and

n^1 and n^2 independently of one another are numbers selected from 4 to 6.

6. The compound of claim 1, having the formula:



wherein

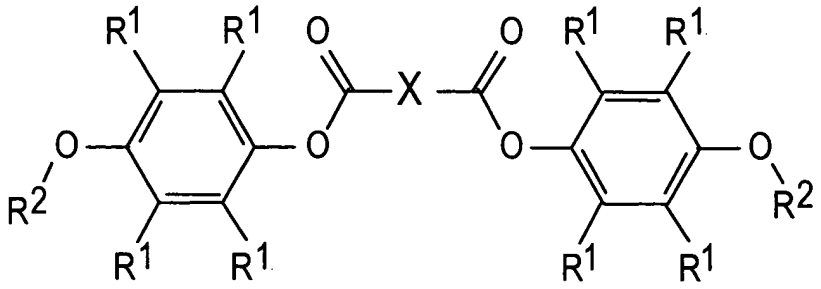
Ar includes a liquid crystalline moiety selected from trans-stilbenediyl, triphenyl, 1,4-bis(phenoxycarbonyl)cyclohexdiyl, diphenyl 1,4-cyclohexanedicaroxylate;

X^1 and X^2 independently of one another are selected from oxygen, carbonyl, carboxyl, oxycarbonyl, and amine;

Y^1 and Y^2 independently of one another are selected from oxygen, carbonyl, carboxyl, oxycarbonyl, and amine; and

n^1 and n^2 independently of one another are numbers selected from 4 to 6.

7. The compound of claim 1, having the formula:



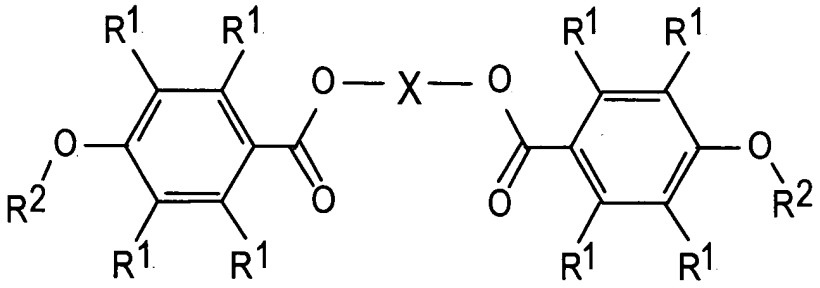
wherein

X is selected from a C_{6-10} aryl group and a C_{5-10} alicyclic group;

each R^1 is independently selected from hydrogen, halogen, and C_{1-3} alkyl optionally substituted with halogen, provided that not more than four of the R^1 are C_2 alkyl optionally substituted with halogen, and provided that not more than three of the R^1 are C_3 alkyl optionally substituted with halogen; and

each R^2 is independently selected from a C_{2-6} epoxy.

8. The compound of claim 1, having the formula:



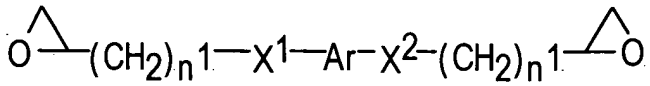
wherein

X is selected from a C_{6-10} aryl group and a C_{5-10} alicyclic group;

each R^1 is independently selected from hydrogen, halogen, and C_{1-3} alkyl optionally substituted with halogen, provided that not more than four of the R^1 are C_2 alkyl optionally substituted with halogen, and provided that not more than three of the R^1 are C_3 alkyl optionally substituted with halogen;

each R^2 is independently selected from a C_{2-6} epoxy.

9. A compound having the formula:



wherein

Ar includes a liquid crystalline moiety;

X^1 and X^2 independently of one another are selected from oxygen, carbonyl, carboxyl, oxycarbonyl, and amine;

n^1 and n^2 independently of one another are numbers selected from 2 to 20.

10. The compound of claim 9, wherein n^1 and n^2 independently of one another are numbers selected from 2 to 10.

11. The compound of claim 10, wherein n^1 and n^2 independently of one another are numbers selected from 2 to 6.

12. The compound of claim 11, wherein n^1 and n^2 independently of one another are numbers selected from 3 to 5.

13. The compound of claim 9, wherein Ar is selected from trans-stilbenediyl, triphenyl, 1,4-bis(phenoxycarbonyl)cyclohexdiyl, and diphenyl 1,4-cyclohexanedicaroxylate.

14. The compound of claim 9, comprising a melting point temperature that is less than 140°C, and liquid crystallinity at a temperature greater than 150°C.

15. A composition comprising:

the compound of claim 9; and

a filler.

16. A method comprising:

contacting a surface with the composition of claim 15; and

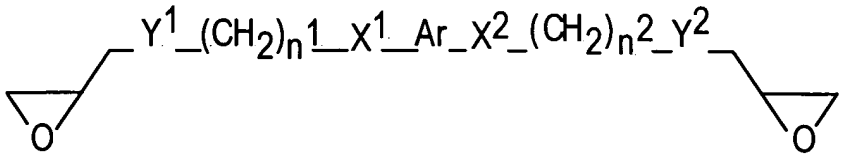
solidifying the composition on the surface by polymerizing the compound.

17. A microelectronic device comprising:

a surface; and

a composition solidified thereon by the method of claim 16.

18. A compound having the formula:



wherein

Ar includes a liquid crystalline moiety;

X^1 and X^2 independently of one another are selected from oxygen, carbonyl, carboxyl, oxycarbonyl, and amine;

Y^1 and Y^2 independently of one another are selected from oxygen, carbonyl, carboxyl, oxycarbonyl, and amine;

n^1 and n^2 independently of one another are numbers selected from 2 to 20.

19. The compound of claim 18, wherein n^1 and n^2 independently of one another are numbers selected from 2 to 10.

20. The compound of claim 19, wherein n^1 and n^2 independently of one another are numbers selected from 2 to 6.

21. The compound of claim 20, wherein n^1 and n^2 independently of one another are numbers selected from 3 to 5.

22. The compound of claim 18, wherein Ar is selected from trans-stilbenediyl, triphenyl, 1,4-bis(phenoxycarbonyl)cyclohexdiyl, and diphenyl 1,4-cyclohexanedicaroxylate.

23 The compound of claim 18, comprising a melting point temperature that is less than 140°C, and liquid crystallinity at a temperature greater than 150°C.

24. A composition comprising:

the compound of claim 18; and

a filler.

25. A method comprising:

contacting a surface with the composition of claim 24; and

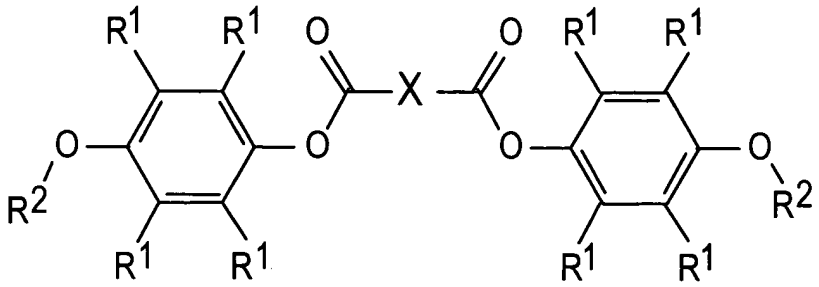
solidifying the composition on the surface by polymerizing the compound.

26. A microelectronic device comprising:

a surface; and

a composition solidified thereon by the method of claim 25.

27. A compound having the formula:



wherein

X is selected from acetylene, vinyl, butadiene, aryl, and alicyclic;

each R^1 is independently selected from hydrogen, halogen, and C_{1-3} alkyl groups optionally substituted with halogen; and

each R^2 is independently selected from a C_{2-10} epoxy.

28. The compound of claim 27, wherein the aryl comprises a C_{6-10} aryl group, and wherein the alicyclic comprises a C_{5-10} alicyclic group.

29. The compound of claim 28, wherein the aryl group is selected from phenyl and napthyl, and wherein the alicyclic group is selected from cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, adamantyl, norbornyl, bicyclo[4.3.0]nonane, bicyclo[3.2.1]octane, and bicyclo[2.2.2]octane.

30. The compound of claim 27, wherein each R^1 is independently selected from hydrogen, halogen, and C_{1-2} alkyl groups optionally substituted with halogen.

31. The compound of claim 27, wherein not more than four of the R^1 comprise C_2 alkyl optionally substituted with halogen.

32. The compound of claim 31, wherein not more than three of the R^1 comprise C_3 alkyl optionally substituted with halogen.

33 The compound of claim 27, wherein R^2 comprises a C_{2-5} epoxy.

34. The compound of claim 27, comprising a melting point temperature that is less than 140°C, and liquid crystallinity at a temperature greater than 150°C.

35. A composition comprising:

the compound of claim 27; and

a filler.

36. A method comprising:

contacting a surface with the composition of claim 35; and

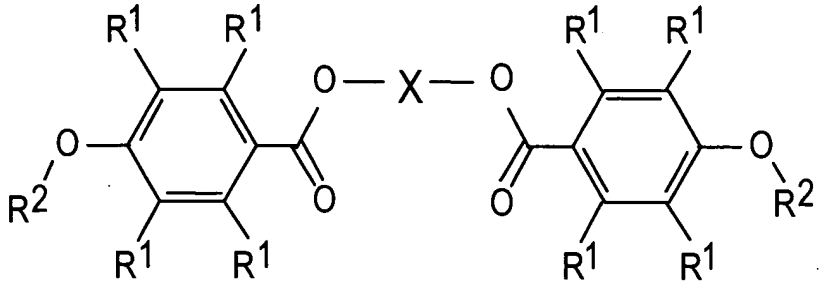
solidifying the composition on the surface by polymerizing the compound.

37. A microelectronic device comprising:

a surface; and

a composition solidified thereon by the method of claim 36.

38. A compound having the formula:



wherein

X is selected from acetylene, vinyl, butadiene, aryl, and alicyclic;

each R^1 is independently selected from hydrogen, halogen, and C_{1-3} alkyl groups optionally substituted with halogen; and

each R^2 is independently selected from a C_{2-10} epoxy.

39. The compound of claim 38, wherein the aryl comprises a C_{6-10} aryl group, and wherein the alicyclic comprises a C_{5-10} alicyclic group.

40. The compound of claim 39, wherein the aryl group is selected from phenyl and napthyl, and wherein the alicyclic group is selected from cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, adamantyl, norbornyl, bicyclo[4.3.0]nonane, bicyclo[3.2.1]octane, and bicyclo[2.2.2]octane.

41. The compound of claim 38, wherein each R^1 is independently selected from hydrogen, halogen, and C_{1-2} alkyl groups optionally substituted with halogen.

42. The compound of claim 38, wherein not more than four of the R^1 comprise C_2 alkyl optionally substituted with halogen.

43. The compound of claim 42, wherein not more than three of the R^1 comprise C_3 alkyl optionally substituted with halogen.

44 The compound of claim 38, wherein R^2 comprises a C_{2-5} epoxy.

45. The compound of claim 38, comprising a melting point temperature that is less than 140°C, and liquid crystallinity at a temperature greater than 150°C.

46. A composition comprising:

the compound of claim 38; and

a filler.

47. A method comprising:

contacting a surface with the composition of claim 46; and

solidifying the composition on the surface by polymerizing the compound.

48. A microelectronic device comprising:

a surface; and

a composition solidified thereon by the method of claim 47.